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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
08/869,275	06/04/1997	CARL T. WITTWER	T8616.CIP5	5556

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EXAMINER

FREDMAN, JEFFREY NORMAN

ART UNIT PAPER NUMBER

1637

DATE MAILED: 11/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

08/869,275

Applicant(s)

WITTWER ET AL.

Examiner

Jeffrey Fredman

Art Unit

1637

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 26 September 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) See Continuation Sheet is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 152, 154 and 155 is/are allowed.
- 6) ☒ Claim(s) See Continuation Sheet is/are rejected.
- 7) ☒ Claim(s) 126, 127, 149 and 150 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>9/26/05</u> . | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

***Status***

1. Claims 13-18, 20-35, 55-59, 79, 80, 82, 121-132, 134-140, 145-152, 154-158, 160, 169-195 and 197 are pending.

Claims 13-18, 20-35, 55-59, 79, 80, 82, 121-125, 128-132, 134-140, 145-148, 151, 156-158, 160, 169-195 and 197 are rejected.

Claims 126, 127, 149 and 150 are objected to as dependent upon rejected claims.

Claims 152 and 154-155 are allowed.

Any rejection which is not reiterated in this action is hereby withdrawn as no longer applicable.

2. Applicant should note that this application has been assigned to a different examiner and Art unit.
3. Applicant should also note that the citations for basis in the most recent response were incorrect, since they were not based upon the specification in the current application, but appeared to be based upon a specification filed in one of the continuations of the current application. This engendered unnecessary confusion since there are, for example, no lines 24-28 on page 67 of the current specification. Applicant appears to be referring to page 133.

***Priority***

4. The current application is not given priority to parent application 08/658,993 and the remaining parent applications because these applications fail to provide descriptive

Art Unit: 1637

support for the current claims. For example, the term "carousel" was not found in the parent application in a review by the examiner. This is consistent with the previous action which also found that priority was not present in the older parent applications.

### ***Claim Interpretation***

5. Several terms of the claims require interpretation. The new limitation on the vessels that have a ratio of volume to external surface area of less than 1 mm simply requires that the vessel have a surface area which is greater than the volume. The phrase "each sample container formed for holding less than 1 milliliter of a sample" is open, with the phrase "holding". Therefore, this limitation simply requires that the container has the capacity to hold an amount less than 1 milliliter.

6. With regard to the various means claims, these claims successfully invoke 35 U.S.C. 112, sixth paragraph, which requires that the means in the reference be one found in the specification. This issue will be addressed in the rejections.

### ***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 13-18, 20-35, 55-57, 82, 121-125, 128-132, 134-140, 145-148, 151, 156-158, 160, 169-195 and 197 are rejected under 35 U.S.C. 102(b) as being anticipated by Fields et al (WO 95/21382).

Art Unit: 1637

Fields teaches a system for performing PCR of claim 13 (see page 5, lines 16-20) comprising:

(a) a plurality of sample containers each for holding a PCR sample (see page 9, lines 1-29, page 14, lines 3-35 and figure 1),

(i) each sample container comprising walls of an optically transparent material (see page 15, lines 18-24),

(ii) each sample container defining a volume having a first and second dimension wherein the first dimension is less than the second dimension and the ratio of volume to external surface area is less than 1 mm (see figure 1, where the samples, numbered 23, clearly have a horizontal dimension that is significantly less than the vertical dimension and where the surface area is greater than the volume, also see page 15, line 10, where the tubes are 10 microliter "reporter tubes")

(iii) each sample container formed for holding less than 1 milliliter of a sample (see page 15, line 10, where the tubes hold 10 microliters, which is less than 1 milliliter),

(b) a rotatable carousel formed for holding said plurality of samples wherein said carousel moves the sample containers one by one to a monitoring position (see page 37, lines 11-18, where "A preferred embodiment of a sample tube reader utilizes a carousel dispensing device that holds up to 12 sample tube holders 10, which are successively placed in carriage 800 for photon counting, whereby multiple readings on each sample tube 23 can be made"),

(c) a forced air heater for simultaneously heating all of the PCR samples (see page 28, line 29 to page 29, line 9)

(d) means for simultaneously cooling all of the PCR samples in the carousel (see page 29, lines 1-9, where the means in the specification include forced cooling by air as on page 29 of Fields(see page 35 of the specification)),

(e) control means for repeatedly operating the heater and cooling (see page 29, lines 10-24, page 30, lines 10-25 and page 33),

(f) means for optically exciting the sample in the monitoring position to cause the sample to fluoresce (see page 39, lines 10-30 and the laser at page 37, line 34)

(g) means for detecting the fluorescence of the excited sample during amplification (see page 39, lines 10-30 and the photomultiplier tube at page 36, lines 5-35).

With regard to claims 14, Fields teaches measurement of the amount of DNA target, a reaction parameter, based upon fluorescence (see page 39, lines 10-30).

With regard to claims 15-17, Fields teaches that the thermal controller permits rapid rates of temperature change (see page 30, lines 10-23).

With regard to claims 18, 125, 151, 178, Fields teaches the use of glass and of capillary tubes which have a volume of 10 microliters (see page 15, line 10).

With regard to claim 20, Fields teaches fluorescence detection of the sample (see page 39, lines 10-30).

Art Unit: 1637

With regard to claims 22, 134, 182, Fields teaches cooling the PCR samples with movement of air (see page 29, lines 1-9).

With regard to claims 23, 135, Fields teaches a microprocessor controller (see page 29, lines 10-24).

With regard to claims 24-27, 31, 32, 136-139, Fields teaches the use of a laser to excite fluorescence, which is the same "means" used in the specification (see page 93, line 20 of specification where a laser is a "means" taught by the specification)(see page 37, line 34 of Fields).

With regard to claims 28, 140, 157, 158, 174, 180, 184-188, 191, 192, Fields teaches fluorescence detection of product and the system inherently has a "means for determining a reaction parameter" where the specification uses a photomultiplier tube (see page 70, line 20) and where Fields teaches detection with the same "means" a photomultiplier tube (see page 36, line 16).

With regard to claims 29-30, 123, 129-130, 175-177, 183, 189, 190, Fields teaches a microprocessor control means that controls the temperatures (see page 29, lines 10-24) which is the same as the "means" for controlling used in the specification (see page 26, for example, of specification).

With regard to claims 33-35, Fields teaches the additional element of repeatedly cycling hot and cool gas with a microprocessor "means" (see page 29, lines 10-24 and page 30, lines 10-24, for example).

With regard to claim 55, 194, Fields teaches the use of multiple samples (see page 14, line 6, for example).

Art Unit: 1637

With regard to claims 56-59, Fields teaches (a) a laser light source (see page 37, line 34), (b) a photomultiplier tube (see page 36, line 16), (c) a microprocessor (see page 29, lines 10-24) and (d) a recording means (see figure 13 B and page 33, lines 29-35).

With regard to claims 82, 121, 122, 132, Fields teaches a light source and light detector that are parallel to a wall along the second dimension (see figure 26 and page 36, for example and see figure 13(b) for recording results).

With regard to claims 124, 131, 148, 179, Fields teaches a carousel (see page 37, lines 11-17) and teaches connection of the sample holder to the conduit moving the sample holder via receiving ports which are associated with the conduit, preferably the carousel (see pages 16-17, for example).

With regard to claims 128, 145, Fields teaches the various "means" as discussed above.

With regard to claims 146, 147, Fields teaches monitoring "means" as a photomultiplier tube (see page 36, line 16) and recording "means" to display the resultant data (see figure 13 B).

With regard to claim 156, Fields teaches a movable platform (see figure 26, which discloses a device which is movable).

With regard to claims 160, 169-173, 193, 195, 197, Fields teaches changes as great as 200 degrees C per second (see page 33, line 20).

With regard to claim 181, Fields teaches a forced air heater (see page 28).



***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claims 58 and 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fields et al (WO 95/21382) in view of Mitoma et al (U.S. Patent 6,144,448)

Fields teaches (a) a laser light source (see page 37, line 34), (b) a photomultiplier tube (see page 36, line 16), (c) a microprocessor (see page 29, lines 10-24) and (d) a displaying and recording means (see figure 13 B and page 33, lines 29-35).

Fields does not teach the use of either a Xenon lamp or light emitting diode as the light source.

Mitoma teaches the use of a Xenon lamp in detection of PCR amplification to measure fluorescence (see column 7, line 24).

It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to use the Xenon lamp of Mitoma for fluorescence detection in the place of the Laser of Fields since these are equivalent light sources for detection of PCR products as taught by Mitoma, who notes "The light source to be used may be a xenon lamp, a D2 lamp, a mercury lamp, a halogen lamp, a discharge tube, laser light, or the like (see column 3, lines 42-45)." As MPEP 2144.06 notes "Substituting equivalents known for the same purpose. In order to rely on equivalence as a rationale supporting an obviousness rejection, the equivalency must be recognized in the prior art, and cannot be based on applicant's disclosure or the mere fact that the components at issue are functional or mechanical equivalents. An express suggestion to substitute one equivalent component or process for another is not necessary to render such substitution obvious. In re Fout , 675 F.2d 297, 213 USPQ 532 (CCPA 1982)."

12. Claims 79 and 80 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fields et al (WO 95/21382) in view of Donohue et al (U.S. Patent 5,311,426).

Fields teaches a system for performing PCR (see page 5, lines 16-20) comprising:

(a) a plurality of sample containers each for holding a PCR sample (see page 9, lines 1-29, page 14, lines 3-35 and figure 1),

(i) each sample container comprising walls of an optically transparent material (see apge 15, lines 18-24),

(ii) each sample container defining a volume having a first and second dimension wherein the first dimension is less than the second dimension and the ratio of volume to external surface area is less than 1 mm (see figure 1, where the samples, numbered 23, clearly have a horizontal dimension that is significantly less than the vertical dimension and where the surface area is greater than the volume, also see page 15, line 10, where the tubes are 10 microliter "reporter tubes")

(iii) each sample container formed for holding less than 1 milliliter of a sample (see page 15, line 10, where the tubes hold 10 microliters, which is less than 1 milliliter),

(b) a rotatable carousel formed for holding said plurality of samples wherein said carousel moves the sample containers one by one to a monitoring position (see page 37, lines 11-18, where "A preferred embodiment of a sample tube reader utilizes a carousel dispensing device that holds up to 12 sample tube holders 10, which are successively placed in carriage 800 for photon counting, whereby multiple readings on each sample tube 23 can be made"),

(c) a forced air heater for simultaneously heating all of the PCR samples (see page 28, line 29 to page 29, line 9)

Art Unit: 1637

(d) means for simultaneously cooling all of the PCR samples in the carousel (see page 29, lines 1-9, where the means in the specification include forced cooling by air as on page 29 of Fields(see page 35 of the specification)),

(e) control means for repeatedly operating the heater and cooling (see page 29, lines 10-24, page 30, lines 10-25 and page 33),

(f) means for optically exciting the sample in the monitoring position to cause the sample to fluoresce (see page 39, lines 10-30 and the laser at page 37, line 34) where Fields teaches a light source and light detector that are parallel to a wall along the second dimension (see figure 26 and page 36, for example and see figure 13(b) for recording results).

(g) means for detecting the fluorescence of the excited sample during amplification (see page 39, lines 10-30 and the photomultiplier tube at page 36, lines 5-35).

With regard to claims 180, Fields teaches the use of glass and of capillary tubes which have a volume of 10 microliters (see page 15, line 10).

Fields does not teach the use of a Stepper motor for rotating the carousel.

Donohue teaches the use of a stepper motor to rotate a carousel in a method of fluorescence detection of DNA (see column 17, lines 34-37).

It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to use the stepper motor to move carousels of Donohue in

Art Unit: 1637

the carousel of Fields since Donohue teaches "Preferably, a high resolution stepper motor 50 is used to rotate the boom arm 30 to position the optical reader 32 and the probe 28 in precise increments along an arcuate path. (see column 17, lines 34-37)."

So an ordinary practitioner would have been motivated to use the stepper motor of Donohue to rotate the carousel of Fields in order to permit precise movement in positioning the tubes for reading by the optical reader, thereby improving resolution, accuracy and sensitivity of the detection.

***Allowable Subject Matter***

13. Claims 126, 127, 149 and 150 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

14. Claims 152 and 154-155 are allowed.

***Response to Arguments***

15. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection necessitated by Applicant's amendment.

***Conclusion***

16. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within


Art Unit: 1637

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey Fredman whose telephone number is (571)272-0742. The examiner can normally be reached on 6:30-3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Benzion can be reached on (571)272-0782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Jeffrey Fredman  
Primary Examiner  
Art Unit 1637

11/8/05

**Continuation of Disposition of Claims:** Claims pending in the application are 13-18,20-35,55-59,79,80,82,121-132,134-140,145-152,154-158,160,169-195 and 197.

**Continuation of Disposition of Claims:** Claims rejected are 13-18,20-35,55-59,79,80,82,121-125,128-132,134-140,145-148,151,156-158,160,169-195 and 197.